REMARKS

This application has been reviewed in light of the Office Action mailed April 21, 2005. Reconsideration of this application in view of the below remarks is respectfully requested. Claims 1-20 are pending in the application with Claims 1, 8 and 12 being in independent form. By the present amendment, Claim 8 has been amended and Claims 12-20 have been newly added. No new matter or issues have been introduced into the disclosure by way of the present amendment.

I. Objection to the Specification

The Examiner requires the title of the application to be replaced with one that is more descriptive of the invention. By way of the present amendment, the title has been amended to recite: "A Hybrid Semiconductor Device Having an N^+ (P) Doped N-Type Gate and Method of Producing the Same". Accordingly, Applicants respectfully request withdrawal of the objection with respect to the specification, and allowance thereof.

II. Objection to Claims 9 and 11

Claims 9 and 11 have been objected to for informalities. Specifically, the following changes have been made: "...having the lowest Fermi level is disposed..." in Claims 9 and 11 replaced with "...having the lowest Fermi level and disposed..." and "...having the highest Fermi level is disposed..." in Claim 11 replaced with "...having the highest Fermi level and disposed..." Accordingly, Applicants respectfully request withdrawal of the objection with respect to Claims 9 and 11, and allowance thereof.

III. Rejection of Claims 1-5, 8 and 10 Under 35 U.S.C. §103(a)

Claims 1-5, 8 and 10 are rejected under 35 U.S.C. §103(a) for allegedly being unpatentable over U.S. Patent No. 5,932,919 issued to Schwalke in view of U.S. Patent No.

5,953,246 issued to Takashima et al. in further view of U.S. Patent No. 6,216,246 issued to Shau and in still further view of U.S. Patent No. 6,573,169 issued to Noble et al. By the present amendment, Claim 8 has been amended in a manner believed to obviate the rejection. Applicants respectfully traverse the rejection of Claim 1.

Claim 1 recites: "A semiconductor device of a polysilicon gate electrode structure having three or more different Fermi levels, wherein: a P type polysilicon having a lowest Fermi level and disposed on a first N type surface channel MOS transistor, a first N type polysilicon having a highest Fermi level and disposed on a second N type surface channel MOS transistor, and a second N type polysilicon having an intermediate Fermi level between the highest and the lowest Fermi levels and doped with both an N type impurity and a P type impurity and disposed on a P channel MOS transistor" and amended Claim 8 recites: "A semiconductor device including a DRAM having a gate electrode of a polymetal structure, comprising: an N^+ gate PMOS containing both a P type impurity and an N type impurity and an N^+ gate NMOS which are disposed in a peripheral circuit, and a P^+ gate surface-channel NMOS containing a P type impurity alone which is disposed in a memory cell." (Emphasis added).

Schwalke teaches a modified buried-channel transistor pair, having a p-type FET with both an n-type and p-type doped gate and an n-type FET with a conventional n-type gate. However, Schwalke does not disclose or suggest a P type polysilicon having a lowest Fermi level disposed on a first N type surface channel MOS transistor, a first N type polysilicon having a highest Fermi level and disposed on a second N type surface channel MOS transistor, as recited in Claim 1 and similarly recited in Claim 8.

Takashima et al. discloses a semiconductor memory device, e.g., a DRAM, capable of holding data without refresh. The Takashima et al. disclosed semiconductor memory device

includes an N-channel transistor having a P-type gate, allowing the transistor to have a high threshold voltage. Shau discloses some benefits realized by utilizing transistors having higher threshold voltages than the peripheral circuitry. Noble et al. discloses advantages of using polysilicon as a gate material to increase reliability and provide superior drains and sources. However, Takashima et al., Shau and Noble et al. fail to overcome the deficiencies of Schwalke, as noted above. Therefore Schwalke, Takashima et al., Shau and Noble et al., taken alone or in any proper combination, fail to disclose or suggest the present invention as recited in Independent Claims 1 and 8, thus Claims 1 and 8 are believed patentably distinct and allowable over the cited prior art references. Accordingly, Applicants respectfully request withdrawal of the rejection with respect to Claims 1 and 8 under 35 U.S.C. §103(a) over Schwalke in view of Takashima et al. further in view of Shau and still further in view of Noble et al.

Claims 2-5 and 10 are dependent from Independent Claim 1 and thus limited by the language recited by that independent claim. Additionally, Claim 10 recites a structural limitation in that the claim language limits the concentration of the P-type impurity that is injected into the first N-type surface channel to a concentration that produces a reduced PN-junction leak current. Therefore for at least the reasons given above for Claim 1, Claims 2-5 and 10 are believed patentably distinct and allowable over the cited prior art references. Accordingly, Applicants respectfully request withdrawal of the rejection with respect to Claims 2-5 and 10 under 35 U.S.C. §103(a) over Schwalke in view of Takashima et al. further in view of Shau and still further in view of Noble et al.

IV. Objection to Claims 6 and 7

Claims 6 and 7 have been objected to for being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base

claim and any intervening claims. However, Claims 6 and 7 are dependent from Independent Claim 1 and thus limited by the language recited by that claim. Therefore, for at least the reasons given above for Claim 1 as well as the Examiner's statement of allowable subject matter recited by Claims 6 and 7, Claims 6 and 7 are believed patentably distinct and allowable over the cited prior art references. Accordingly, Applicants respectfully request withdrawal of the objection with respect to Claims 6 and 7.

V. Newly Added Claims 12-20

Claims 12-20 have been newly added by way of the present amendment. Claim 12 is an independent claim reciting the limitations of Independent Claim 1 and Dependent Claim 6, thus no new matter or issues have been introduced by the newly added Claim 12.

As noted by the Examiner in the present Office Action, the prior art fails to disclose or suggest a P type polysilicon having a lowest Fermi level, the P type polysilicon being disposed on a first N type surface channel MOS transistor, a first N type polysilicon having a highest Fermi level, the first N type polysilicon being disposed on a second N type surface channel MOS transistor, and a second N type polysilicon having an intermediate Fermi level between the highest and the lowest Fermi levels and doped with both an N type impurity and a P type impurity, the second N type polysilicon being disposed on a P channel MOS transistor, and being formed by simultaneously activating both the N-type and P-type dopants, as recited by Independent Claim 12. Therefore Claim 12 is believed patentably distinct and allowable over the cited prior art references.

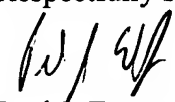
Claims 13-20 are dependent from Independent Claim 12 and thus are limited by the language recited by that independent claim. Therefore for at least the reasons given above for Claim 12, Claims 13-20 are believed patentably distinct and allowable over the cited prior art references. Accordingly, Applicants respectfully request allowance of Claims 12-20.

CONCLUSIONS

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-20 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Applicants' undersigned attorney at the number indicated below.

Respectfully submitted,



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